

Silicon wafer especially SOI wafer production

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Abstract

A silicon wafer (6) production process involves (a) implanting hydrogen ions through a silicon oxide layer-coated silicon wafer surface to form a hydrogen-implanted layer (4); (b) bonding a substrate (5) to the wafer surface; (c) heating the wafer (1) to break off its surface at the hydrogen-implanted layer (4); and (d) heating the wafer portion (6), bonded to the substrate (5), in a hydrogen atmosphere to smooth the exposed broken surface of the wafer (6). Also claimed is a similar silicon wafer (6) production process, in which step (d) is replaced by (d') epitaxial silicon growth on the broken surface to form a new smooth surface. Preferably, step (d) is carried out by annealing at 1050-1350 deg C, plasma heating in a hydrogen atmosphere or rapid thermal annealing and step (d') is carried out by epitaxial growth in trichlorosilane, dichlorosilane, monochlorosilane or monosilane at 1-800 deg C. Further claimed is a silicon wafer produced by one of the above processes.

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